



NCRN Natural Resource Quarterly

SPRING 2014

Visualizing Water Quality

There's been a polar vortex, a few snowstorms, and several long stretches of below freezing temperatures. And even though most water bodies were sporting a thick coat of ice, there's still been plenty of activity from the I&M water monitoring crew this winter.

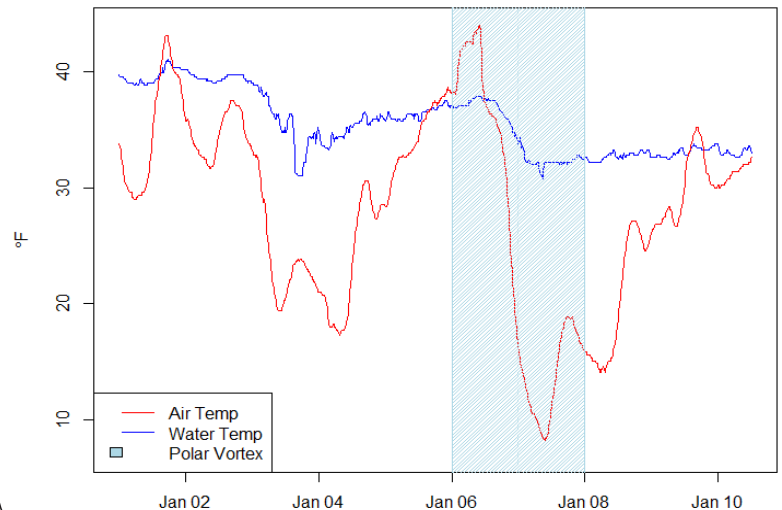
Visualizing Water Quality Data

One notable development this season that you can peruse while indoors, is a new online tool for viewing water quality in the 37 freshwater streams monitored by I&M. The interactive "water visualizer" lets you see water data for a particular stream in graph format, along with threshold levels, and any seasonal patterns or overarching trends (see lower figure). You can also download raw data in an Excel file. The data available for display spans the period of June 2005 to present and *(Continued page 2)*

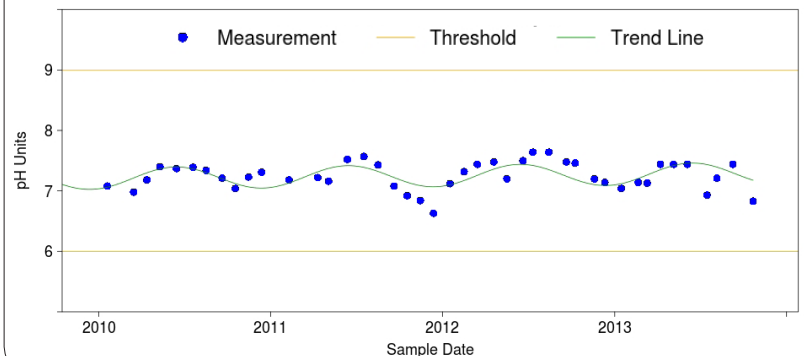
Upper: During the first polar vortex of 2014 (blue shaded area) air temperatures (red line) plummeted, while water temperatures (blue line) made a slower descent, and then stayed at a new low.

Lower: This custom graph of pH levels in South Fork Quantico Creek (PRWI) from 2010-2013 was produced using I&M's new Water Visualizer. It shows how pH levels stayed well within the acceptable range (orange lines at 6 and 9) and also shows a seasonal pattern (wavy green line) that peaks in summer and dips in winter.

Temperatures at Piscataway During Polar Vortex



South Fork Quantico Creek: pH



Coming to Your Park this Spring...

Field work scheduled for March/April/May 2014	ANTI*	CATO	CHOH	GWMP	HAFE	MANA	MONO	NACE	PRWI	ROCR	WOTR
I&M Amphibian Monitoring			x			x			x	x	
Exotic Plant Management	x	x	x	x	x	x	x	x	x	x	x
I&M Forest Vegetation Monitoring	x	x	x	x	x	x	x	x	x	x	x
I&M Marsh Elevation Monitoring				x				x			
I&M Water Monitoring	x	x		x	x	x	x	x	x	x	x

*Park acronyms on page 3

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(*Water continued*)

will continue to be updated as more data is gathered. The visualizer is available at: http://science.nature.nps.gov/im/units/ncrn/monitor/water_quality/visualizer.cfm.

Changes to I&M Monitoring

As of October 2013, NCRN now monitors its 37 stream sites on a seasonal basis—every three months. This shift comes a year after continuous data logging devices were deployed at 7 sites to begin collection of extremely detailed data—measurements every 15 minutes. This continuous monitoring is best for capturing data that fluctuates on a daily basis or with storm events. The loggers measure conductivity, dissolved oxygen, water temperature, air temperature, water level, and air pressure at 15-minute intervals.

Two additional continuous loggers were deployed in the Potomac River during 2011 to monitor salinity levels

and temperatures. During the polar vortex in January, the logger at Piscataway measured the dramatic drop in air and water temperatures seen in the upper figure (previous page). After the vortex passed, air temperatures quickly increased, but water temperatures remained low.

Brief on Water Program & Results

There's also a new overview brief on the NCRN I&M water monitoring program that includes a summary of 8 years of water data. It's available at: http://science.nature.nps.gov/im/units/ncrn/assets/docs/RBs/NCRN_Water_Monitoring_2014.pdf.

For more information about NCRN I&M water monitoring, go to: http://science.nature.nps.gov/im/units/ncrn/monitor/water_quality/index.cfm

Interns Help Discover & Tell Climate Change Stories in NCR Parks

Giselle Mora-Bourgeois

In 2012 NCR's Urban Ecology Research Learning Alliance and the Center for Climate Change Communication (4C) at George Mason University, initiated a Climate Change Communication Internship program to support parks in the NCR as they face the challenges posed by climate change. The program's focus is developing outreach and educational messages and products in a variety of media, while providing mentoring, training, and skills development for student interns.

The strength of this internship program is its interdisciplinary approach. Interns' backgrounds represent diverse cultural perspectives and expand the natural and social sciences. An interdisciplinary team is extremely important for climate change communication projects; developing effective products requires people who understand the complex science and people who get the equally complex psychology of how people think, and everything in between.

Some of the accomplishments for the summer of 2013 included:

- completing research and creating content for three climate change wayside exhibits (Kenilworth Aquatic Gardens, Rock Creek, and Wolf Trap),
- a climate change communication guide based on the Six Americas research project,

- preparing a research proposal and request for approval to the Office of Management and Budget (OMB) for visitor survey planned for summer of 2014.

For information on the 2012-2013 projects and to see our intern profiles please visit us at: <http://www.climatechangecommunication.org/national-park-service-climate-change-communication-internship-program>

Internships will be offered in 2014 and 2015. If you are interested in hosting a climate change communication project please contact Giselle Mora-Bourgeois by NPS email or at 202-339-8320.



Climate change communication interns explore Kenilworth Aquatic Gardens.

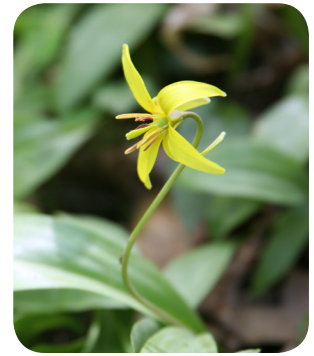
Photo: NPS/Mora-Bourgeois

Spring Wildflower Walk at Turkey Run

NCRN I&M Botanist Elizabeth Matthews will lead a wildflower walk on Friday, April 11 (10am - 2pm) at Turkey Run, part of the George Washington Memorial Parkway.

On the walk, Liz will lead an exploration of spring wildflowers as well as trees, ferns, and much more. All are welcome but space is limited. Participants should bring water, lunch, camera, and field guide. (Bird enthusiasts should consider bringing binoculars too.)

Please RSVP to Elizabeth Matthews by NPS email or at 202-339-8303. Walk will begin at parking area C-1 (<http://www.nps.gov/gwmp/planyourvisit/upload/Turkey-Run-Park-map.pdf>).



Trout lily

Photo: NPS/Lehman

Changing Forests: New Briefs on Tree Species & Climbing Vines

Change is afoot in NCR forests. Tree species are shifting as forests mature, and climbing vines are on the rise. These are just a few of the insights extracted from 8 years of NCRN forest monitoring data by NCRN I&M Botanist Liz Matthews and put into resource brief form. Read these and other briefs on forest vegetation at: <http://science.nature.nps.gov/im/units/ncrn/publications.cfm>

Species Shifts in Maturing Forests

Hello beech trees, goodbye Virginia pines! Graphics in this brief show the change in abundance of common trees like red

maple, American beech, tulip poplar, white oak, and more. Discussion covers declines in oak numbers, potential impacts of Emerald Ash Borer, and increases in shade-tolerant species.

Climbing Vines on the Rise

Vines have the potential to change a forest's structure and species composition, and they're also on the increase. Grape vines are the most abundant in NCR forests, but exotics like Japanese honeysuckle and multiflora rose are increasing twice as fast as grapes. Discussion covers exotics, vine-animal interactions, and the toxicity of poison ivy.

New Natural Resource Condition Assessments

Catoctin, C&O Canal, and Harpers Ferry have now joined the ranks of NCR parks with completed Natural Resource Condition Assessments (NRCAs) including Rock Creek, Antietam, Manassas, and Monocacy.

All completed NRCAs for the National Capital Region are available under "Protocols & Planning" at: <http://science.nature.nps.gov/im/units/ncrn/publications.cfm>.

New Aquatic Ecology Websites for National Capital & Northeast

Forgot when BMP (Best Management Practices) reporting is due or curious about the latest on didymo (rock snot)? New websites on the Chesapeake Bay Executive Order and issues in aquatic ecology, courtesy of NCR and Northeast Region Aquatic Ecologist Marian Norris, are here to help.

The site on aquatic ecology: <https://sites.google.com/a/nps.gov/marian-norris/> includes a variety of announcements and subpages on aquatic nuisance species, shale gas development,

laws & regulations, and wetlands.

The Chesapeake Bay Executive Order site: <https://sites.google.com/a/nps.gov/ncr-ner-chesapeake-bay-eo/> includes links to subpages on land conservation & public access, recovering habitat, responding to climate change, restoring clean water, science, state planning, and the executive order and planning documents.

Park Acronyms

ANTI = Antietam National Battlefield
CATO = Catoctin Mountain Park
CHOH = Chesapeake & Ohio Canal National Historical Park
GWMP = George Washington Memorial Parkway
HAFE = Harpers Ferry National Historical Park
MANA = Manassas National Battlefield Park

MONO = Monocacy National Battlefield
NACE = National Capital Parks - East
NAMA = National Mall and Memorial Parks
PRWI = Prince William Forest Park
ROCR = Rock Creek Park
WOTR = Wolf Trap National Park for the Performing Arts

NCR Amphibian Habitat Mapping

I&M is currently mapping amphibian habitat in several NCR parks. This mapping effort could open doors for expanded I&M amphibian monitoring should funding become available in the future. During 2013, amphibian habitat was mapped at Catoctin and Harpers Ferry. In coming years, habitat mapping will cover Manassas, Prince William, Antietam, Monocacy, National Capital Parks – East, Wolf Trap, and GW Parkway.

To map the places where amphibians are likely to be found, researchers walk every perennial stream in the park, check every potential pool, visit a series of points spread in a grid across the park, and check spots recommended by park staff. Potential habitat locations are photographed, described

on a data sheet, and marked using GPS.

Currently, I&M monitors stream amphibians at Prince William and Rock Creek, wetland amphibians at Manassas, and both wetland and stream amphibians at C&O Canal. (ROCR wetland amphibian data is gathered by ROCR staff and included in I&M analysis.)

Information on NCRN amphibian monitoring can be found at: <http://science.nature.nps.gov/im/units/ncrn/monitor/amphibians/index.cfm>.



Pickerel frog (*Rana palustris*)

Photo: NPS

Simple Species List Generator for NCR Parks

Parks now have a simple option for generating species lists from the IRMA database. A new tool available through the NCRN website allows users to specify a park, and then select a list of all species or just mammals, plants, fish, birds, or amphibians & reptiles. Lists are printable and downloadable and can be just a checklist or a full list with details.

The NPSpecies development team is working on a similar

tool that can be added into a park CMS webpages to display dynamic NPSpecies data about your park.

For NCRN's Species List generator, go to: http://science.nature.nps.gov/im/units/ncrn/species_lists.cfm

Calendar

MARCH

13. **Spotlight on National Park Resources.** National Conservation Training Center, Shepherdstown, WV. 9am - 3:30pm.

APRIL

2. Presentation on urban foraging by Marla Emery, USFS Research Geographer. Office of Natural Resources & Science (aka CUE) 9am - 10am.

17. **NAT (Natural Resources Advisory Team) Meeting.** Wolf Trap

MAY

7. Presentation on Soils from UFORE Plots by Rich Pouyat & Ian Yesilonis. Office of Natural Resources & Science (aka CUE) 9am - 10am.

National Capital Region Network Inventory & Monitoring (NCRN I&M) Staff:

Program Manager: Patrick Campbell
Botanist: Liz Matthews
Data Manager: Geoff Sanders
GIS Specialist: Mark Lehman
Hydrologic Technician: Jim Pieper
Hydrologic Technician: Tonya Watts
Quantitative Ecologist: John Paul Schmit
Science Communicator: Megan Nortrup

Visit NCRN I&M online at:

Website: <http://science.nature.nps.gov/im/units/ncrn/index.cfm>
Sharepoint: <http://sharenrss/im/networks/NCRN/default.aspx>
RSS: http://science.nature.nps.gov/im/units/ncrn/rss/ncrn_rss.xml
Twitter: <https://twitter.com/NPSNCRN>

NCRN Natural Resource Quarterly offers updates on the status of park natural resources and Inventory and Monitoring (I&M) "vital signs" for the NPS National Capital Region Network (NCRN).

Questions or comments? Contact Megan Nortrup by NPS email or at 202-339-8314